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Response and Amendment

REMARKS

By the present *Response and Amendment*, Claims 6, 13, 14, 19, 23, and 25-32 are canceled, Claims 1-5, 7-12, 15-18, 20-22, and 24 are amended, and Claims 33-45 are added. The amendments to the claims and the newly added claims are supported by the application as originally filed, and do not introduce new matter. It is respectfully submitted that the present Application is in condition for allowance.

DOCKET NUMBER AND CHANGE IN CORRESPONDENCE ADDRESS

Applicant respectfully requests the docket number of this Application be changed from 163.1773USU1 to GTRC183. The prosecution of this Application has been transferred to a new law firm, and its docketing procedures would benefit with this new docket number. A *Power of Attorney and Correspondence Address Indication Form* to the present firm is filed concurrently in the USPTO to reflect that the new law firm is now prosecuting this Application.

Please note the new Applicant is a small entity, and thus fees related to this application should reflect such status.

REJECTION OF CLAIMS 1, 5-7, 11-16, 18-20, 22, AND 23 UNDER 35 U.S.C. § 102(b)

Claims 1, 5-7, 11-16, 18-20, 22, and 23 are rejected under 35 U.S.C. § 102(b) as being anticipated by Gesser patent No. 4,892,719 ("the '719 patent"). Applicant respectfully traverses this rejection in view of the present amendments, although Claims 6, 13, 14, 19, and 23 are canceled for issues of clarity.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). Claims 1, 5, 7, 11, 12, 15, 16, 18, 20, and 22 now recite that the absorptive system comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system or a water content of at least about 5 percent by weight. It is respectfully submitted that these recited limitations/elements are not found in the '719 patent. Therefore, Claims 1, 5, 7, 11, 12, 15, 16, 18, 20, and 22 of the present application are patentable over the '719 patent.

REJECTION OF CLAIMS 1, 5, 6, 11, AND 13-16 UNDER 35 U.S.C. § 102(b)

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Claims 1, 5, 6, 11, and 13-16 also are rejected under 35 U.S.C. § 102(b) as being anticipated by Kojima et al patent No. 3,627,703 ("the '703 patent"). Applicant respectfully traverses this rejection in view of the present amendments, although Claims 6, 13, and 14 are canceled for issues of clarity.

The '703 patent teaches a polypropylene resin-based ion-exchange material. The '703 patent does not disclose a filter, and it is silent to the presently claimed gas filter. Furthermore, it does not disclose a gas filter comprising an absorptive system which comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system or a water content of at least about 5 percent by weight. Therefore, Claims 1, 5, 11, and 15-16 of the present application are respectfully submitted as patentable over the '703 patent.

Furthermore, Applicant respectfully submits that column 3, lines 43-44 of the '703 patent, which reads, "[t]he ion-exchange material preferably be in finely divided form such as particles of sizes less than 100 mesh," does not disclose the "separated throughout the filter" limitation as alleged by the Examiner. Applicant also respectfully submits that column 4, lines 25-29 of the '703 patent, which reads, "[u]pon completion of the chemical treatment, the composite is washed with water and dried," does not teach a water additive. In fact, it specifically teaches that the composite needs to be dried to eliminate the water in the composite.

REJECTION OF CLAIMS 2 AND 3 UNDER 35 U.S.C. § 103(a)

Claims 2 and 3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kojima et al in view of Takashima et al patent 5,627,329 ("the '329 patent"). Applicant respectfully traverses this rejection in view of the present amendments, although clarification is sought.

The '329 patent is granted to inventors Chandrasekhar Krishnan, Jian S. Qi, Joseph A. Incavo, William L. Reuter, and Vivek Jain. Takashima is not an inventor. Another reference cited in the *Office Action*, U.S. Patent No. 3,876,565 ("the '565 patent"), does name Naichi Takashima as the first inventor. Thus, it is not clear that whether the Examiner intended the '329 patent or the '565 patent as the basis for the 35 U.S.C. § 103(a) rejection, although other sections of the *Office Action* suggest that the '565 patent may be intended. Nonetheless, Applicant respectfully submits that Claims 2 and 3 of the present invention are not obvious over Kojima (i.e., the '703 patent) in view of either the '329 patent or the '565 patent.

The standard for making a *prima facie* case of obviousness is well-established and clearly

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summarized at §2143 of MPEP. "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." MPEP §2143.

First, Applicant respectfully submits that there is no suggestion or motivation, either in the cited references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the teachings of the '703 patent and the '329 patent or the '565 patent. In fact, there is clearly evidence that these references, especially the '329 patent, are not even in the same art as the '703 patent, i.e., they are not "analogous prior art" for the purpose of analyzing the obviousness of the subject matter at issue and thus, should not have been relied upon by the Examiner as a basis for making a 35 U.S.C. § 103(a) rejection. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446 (Fed. Cir. 1992). See also *In re Deminski*, 796 F.2d 436 (Fed. Cir. 1986); *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992) ("A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem.").

For example, besides not teaching a gas filter, Applicant respectfully submits that both the '703 patent and the '565 patent also fail to provide information for one with ordinary skill in the art to evaluate whether the polypropylene resin-based ion-exchange material is a material which could be used in manufacturing a gas filter. While an ion-exchange material could be used to make a filter, there is no evidence that the polypropylene resin-based ion-exchange material taught by the '703 patent and the '565 patent could be used to make a gas filter.

A material suitable for making one type of filter, such as, a water filter, or an oil filter, may be completely incompatible for another type of filter, such as a gas filter (e.g., an air filter). For example, an ion-exchange material may create a pressure drop to a degree making it not

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suitable for making an air filter.

It is respectfully submitted that (1) there is no support that the '703 patent and the '565 patent are in the same art, i.e., the gas filter art, as the present application; and (2) both of the references are not reasonably pertinent to the particular problem with which the present invention was concerned, i.e., filtering gas. Accordingly, these references should not be relied upon by the Examiner as a basis for making a 35 U.S.C. § 103(a) rejection.

The '329 patent teaches a method of determining a diffusion coefficient for a diffusant in a small particulate. The '329 patent does not teach filter of any kind, and thus not a gas filter. It is not a "analogous prior art" for the purpose of analyzing the obviousness of the subject matter at issue not only because it is in a non-analogous art, but also because it is not reasonably pertinent to the particular problem with which the present invention was concerned, i.e., filtering gas. Accordingly, the '329 patent should not be relied upon by the Examiner as a basis for making a 35 U.S.C. § 103(a) rejection.

Second, Applicant respectfully submits that the references, even when combined, fail to teach or suggest all the claim limitations of Claims 2 and 3. None of the reference cited, i.e., the '703 patent, the '329 patent, and the '565 patent, teaches a gas filter. Neither do they teach a gas filter with features currently recited in Claims 2 and 3, such as, an absorptive system which comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system or a water content of at least about 5 percent by weight, or a polymer matrix comprises a polymer having a diffusivity of greater than 10^{-8} cm²/sec, or a T_g of less than about 20 °C. Therefore, the combination of the '703 patent either with the '329 patent or with the '565 patent fail to teach or suggest all the claim limitations. Consequently, current Claims 2 and 3 of the present application are not obvious over the teaching of the '703 patent either in view of the '329 patent or in view of the '565 patent.

In fact, the '329 patent teaches away from the particular problem with which the present invention is concerned. For example, the '329 patent requires that the diffusant "must leave the particle in a gaseous state" (column 3, lines 18-19). The present invention relates to a gas filter which binds and retains contaminants in the gas filter, not actively releasing them back to the gas stream.

Applicant further respectfully submits that there is no teaching of an "ion exchange

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membrane having high degrees of flux, hence diffusivity" in either the '329 patent or the '565 patent, as alleged by the Examiner, and certainly not a polymer having a diffusivity of greater than 10^{-8} cm²/sec. Accordingly, Applicant respectfully submits that there is no evidence to support the statement that it "would have been obvious to have considered the polymers disclosed by Kojima et al to have the claimed diffusivity, as taught by Takashima et al" because none of the '703 patent, the '329 patent, and the '565 patent teaches a polymer with a high diffusivity.

REJECTION OF CLAIM 4 UNDER 35 U.S.C. § 103(a)

Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the '703 patent in view of "Takashima et al as applied to claim 3" and further in view of Oda et al patent No. 4,666,574 ("the '574 patent"). Applicant respectfully traverses this rejection in view of the present amendments.

Applicant respectfully submits that there is no teaching, suggestion, or motivation, either in the cited references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the cited references individually or to combine these references' teachings to create the presently claimed invention.

As discussed, *supra*, the '703 patent and the "Takashima et al" patent are not analogous prior art, and thus it is inappropriate to rely upon these references for making a 35 U.S.C. § 103(a) rejection. In addition, the '574 patent teaches an ion-exchange membrane electrolytic cell and electrolytic process using the same. The '574 patent teaches a device for use in a liquid environment, which is clearly not pertinent to a gas filter, which operates in a gaseous environment. Applicant respectfully submits that these references, especially the '574 patent, are not reasonably pertinent to the particular problem with which the present invention is concerned, i.e., filtering gas, because they are not "one which logically would have commended itself to an inventor's attention in considering his problem," as such, they should not be have been relied upon by the Examiner for making a 35 U.S.C. § 103(a) rejection.

Furthermore, amended Claim 4 recites a gas filter with non-obvious features, such as, an absorptive system which comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system or a water content of at least about 5 percent by weight, and a polymer comprises a high molecular weight poly(acrylamide) having a weight

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average molecular weight ranging from about 1 million to about 50 million. Applicant respectfully submits that the references, even when combined, failed to teach or suggest any of these limitations of current Claim 4 and thus can not render Claim 4 obvious.

Applicant further respectfully submits that the cited references, even when combined, teach away from the claimed invention. The '703 patent teaches an ion-exchange material and the "Takashima et al" patent may also teach an ion-exchange material, as discussed, *supra*, while the '574 patent teaches an ion-exchange membrane electrolytic cell and electrolytic process using the same. When combined, these references teach using ion-exchange materials, such as those taught by the '703 patent, to make an ion-exchange membrane electrolytic cell for use in an electrolytic process, which operates in a liquid environment. This teaching is against the teaching of the present invention, i.e., making a gas filter and filtering gas, which operates in a gaseous environment (e.g., in the air). Therefore, the cited references when combined teach away from the gas filter of Claim 4 and thus can not render Claim 4 obvious.

REJECTION OF CLAIMS 7-10 UNDER 35 U.S.C. § 103(a)

Claims 7-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the '703 patent in view of the '565 patent. Applicant respectfully traverses this rejection in view of the present amendments.

Applicant respectfully submits that there is no teaching, suggestion, or motivation, either in the cited references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the cited references individually or to combine these references' teachings to create the presently claimed invention.

As discussed, *supra*, the '703 patent and the '565 patent are not analogous prior art and thus it is inappropriate to rely upon these references for making a 35 U.S.C. § 103(a) rejection.

Applicant respectfully submits that the references, even when combined, fail to teach or suggest all the claim limitations of Claims 7-10. Neither reference cited, i.e., the '703 patent and the '565 patent, teaches a gas filter. Neither do they teach any gas filter with the currently claimed features, such as, an absorptive system which comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system or a water content of at least about 5 percent by weight, a carboxylic acid reactive additive, water, or reactive nanoparticles, limitations recited in Claims 7-10. Therefore, the combination of the '703

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patent with the '565 patent fail to teach or suggest all the claim limitations. Consequently, Claims 7-10 of the present application are non-obvious over the '703 patent in view of the '565 patent.

In addition, Applicant respectfully submits that column 4, lines 38-39 of the '565 patent does not teach a carboxylic acid reactive additive, as alleged by the Examiner. The carboxylic acid molecule, as taught by column 4, lines 38-39 of the '565 patent, is part of the backbone of the polyolefin, which is not available for participating in a process for sequestering and removing contaminant from a gas, i.e., it is not a "reactive additive" but a non-active structural unit of a polymer.

Applicant also respectfully submits that column 4, lines 25-29 of the '703 patent, as discussed, *supra*, does not teach a water additive. In fact, it specifically teaches that the composite needs to be dried to eliminate the water.

Furthermore, Applicant respectfully submits that column 4, lines 44-48 of the '565 patent, which reads, "The lower limit of the particle size is of few microns," does not teach nanoparticles as recited in Claim 10.

REJECTION OF CLAIMS 12, 17-21, 24, AND 27-29 UNDER 35 U.S.C. § 103(a)

Claims 12, 17-21, 24, and 27-29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the '703 patent in view of the '574 patent. Applicant respectfully traverses this rejection in view of the present amendments, although Claims 19 and 27-29 are canceled for issues of clarity.

Applicant respectfully submits that there is no teaching, suggestion, or motivation, either in the cited references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the cited references individually or to combine these references' teachings to create the presently claimed invention.

As discussed, *supra*, the '703 patent and the '574 patent are not analogous prior art and thus it is inappropriate to rely upon these references for making a 35 U.S.C. § 103(a) rejection.

Amended Claims 12, 17, 18, 20, 21, and 24 recite a gas filter with features, such as, an absorptive system which comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system or a water content of at least about 5 percent by weight. Applicant respectfully submits that the references, even when combined, fail to teach or

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suggest any of these limitations of Claims 12, 17, 18, 20, 21, and 24. Neither reference cited even teaches a gas filter.

Furthermore, the cited references, even when combined, teach away from the claimed invention. The '703 patent teaches an ion-exchange material and the '574 patent teaches an ion-exchange membrane electrolytic cell and electrolytic process using the same. When combined, these references teach using ion-exchange materials, such as those taught by the '703 patent, to make an ion-exchange membrane electrolytic cell for use in an electrolytic process, which operates in a liquid environment. This teaching is against the teaching of the present invention, i.e., making a gas filter and filtering gas, which operates in a gas environment (e.g., in the air). Therefore, the teaching of the cited references when combined teaches away from the gas filter as claimed in Claims 12, 17, 18, 20, 21, and 24 and thus can not render obvious of these Claims.

REJECTION OF CLAIMS 23 AND 32 UNDER 35 U.S.C. § 103(a)

Claims 23 and 32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the '703 patent in view of the '714 patent. Applicant respectfully traverses this rejection, although Claims 23 and 32 are canceled for issues of clarity.

REJECTION OF CLAIMS 22, 25, AND 26 UNDER 35 U.S.C. § 103(a)

Claims 22, 25, and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the '703 patent in view of the '574 patent and the "Takashima et al" patent. Applicant respectfully traverses this rejection in view of the present amendments, although Claims 25 and 26 are canceled for issues of clarity.

As discussed, *supra*, the '703 patent, the "Takashima et al" patent, and the '574 patent are not analogous prior art and thus it is inappropriate to rely upon these references for making a 35 U.S.C. § 103(a) rejection.

Amended Claim 22 recites a gas filter with features, such as, an absorptive system which comprises an absorption capacity of at least about 0.01 gram of captured contaminants per gram of the absorptive system or a water content of at least about 5 percent by weight. Applicant respectfully submits that the references, even when combined, fail to teach or suggest these current limitations of Claim 22. Indeed, none of the reference cited teaches even a gas filter.

Applicant further respectfully submits that the cited references, even when combined,

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teach away from the claimed invention. The '703 patent teaches an ion-exchange material and the "Takashima et al" patent may also teach an ion-exchange material, as discussed, *supra*, while the '574 patent teaches an ion-exchange membrane electrolytic cell and electrolytic process using the same. When combined, these references teach using ion-exchange materials, such as those taught by the '703 patent, to make an ion-exchange membrane electrolytic cell for use in an electrolytic process, which operates in a liquid environment. This teaching is clearly against the teaching of the present invention as claimed in Claim 22, i.e., a gas filter, which operates in a gas environment (e.g., in the air). Therefore, the teaching of the cited references when combined teaches away from the gas filter as claimed in Claim 22 and thus can not render obvious of these Claims.

In addition, Applicant respectfully submits that the "Takashima et al" patent does not teach a carboxylic acid reactive additive of the present invention, as alleged by the Examiner. The carboxylic acid molecule, as taught by column 4, lines 38-39 of the '565 patent, is part of the backbone of the polyolefin, which is not available for participating in a process for sequestering and removing contaminant from a gas, i.e., it is not a "reactive additive" but a non-active structural unit of a polymer.

Applicant also respectfully submits that column 4, lines 20-29 of the '703 patent does not teach a water additive. In fact, it specifically teaches that the composite needs to be dried to eliminate the water.

REJECTION OF CLAIMS 30 AND 31 UNDER 35 U.S.C. § 103(a)

Claims 30 and 31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the '703 patent in view of the '574 patent and the '714 patent. Applicant respectfully traverses this rejection, although Claims 30 and 31 are canceled for issues of clarity.

FEES

No Claims fees are due, as the total number of Claims, and independent Claims, remains the same as originally filed (32), and three (3), respectively.

This *Response and Amendment* is being filed within six months of the *Office Action*, and more specifically within four months. A petition and the fee for an one-month extension of time to extend the time to respond to the present Office Action is respectfully requested. The

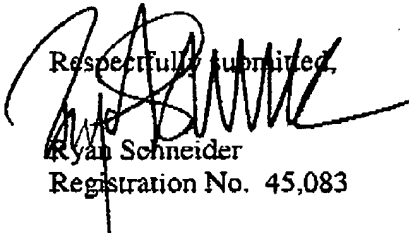
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Commissioner is authorized to charge the \$60 fee for the one-month extension of time as well as any deficiency or credit any overpayment to Deposit Account No. 20-1507. The extension of time fee is for a small entry.

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CONCLUSION

By the present *Response and Amendment*, the Application has been in placed in full condition for allowance. Accordingly, Applicant respectfully requests early and favorable action. Should the Examiner have any further questions or reservations, the Examiner is invited to telephone the undersigned Attorney at 404.885.2773.

Respectfully submitted,

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Certificate of Transmission:

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